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## THE BLUEBERRY SPAN-WORM (DIASCTIS INCEPTARIA, WALK.) AND THE BUMBLE FLOWER-BEETLE (EUPHORIA INDA, LINN.).

BY M. V. SLINGERLAND, CORNELL UNIVERSITY, ITHACA, N. Y.

On May 20th, 1896, I received the following letter from a correspondent in Mount Vernon, N. H.: "I enclose you worms that are making sad havoc with the blueberry crop in this section. They seem to be great feeders, completely stripping the bushes of leaves and blossoms, but do not touch the green berries after they begin to form. The berry fields look as though a fire had passed over them, and the worms have nearly ruined the blueberry crop in this vicinity.

"This blueberry (*Vaccinium pennsylvanicum*) needs no cultivation, only to burn over the old bushes every few years, when the new bushes will shoot up and bear the following year. There are hundreds of acres of land producing these berries in this and neighbouring towns, and so far as I can learn, about three-fifths of the crop has been destroyed by the worms."

Accompanying the letter were four nearly full-grown span-worms and one pupa. The larvæ were new to me, and their ravages described above also made them interesting from an economic standpoint. One was therefore photographed, about three times natural size; both dorsal and lateral views of it are shown on the plate. When full-grown the larvæ measure about five-eighths of an inch in length and are peculiarly marked, as the figures show. The general colour of the body is light yellowish-purple. The dark portions are of a dead black colour. The sutures of the head are broadly margined with white, and a broad white band crosses the sides of the head. The mesal stripe on the dorsum is light yellow, as is also the narrow stripe extending along the subdorsal region through the large black areas. The broad stigmatal stripe is light orange-yellow, whitish below each large black area. Spiracles black. The large black subdorsal areas are in a broad light purplish stripe. The body is sparsely

clothed with black hairs. The true legs are black, with yellow bands at the extremities of the joints. Venter yellowish, tinged with purple.

On May 22nd, one of the larvæ changed to a pupa on the soil in my cage. The worms would not eat the currant leaves placed in the cage. The pupa is of a very dark, shining brown colour, with the abdomen a little lighter and sparsely punctate.

As the other pupa and the larvæ had all died, the pupa just described was watched with much interest daily. At last, on the twelfth day (June 4), a dainty, modest little Quaker-gray moth emerged. It is shown, twice natural size, on the plate. About the only noticeable markings on the wings are one or two blackish spots on the costa of each front wing. The antennæ are quite strongly pectinated. The moth was at once sent to Mr. Hulst, who determined it as *Diastictis inceptaria*, Walk. In an illustrated communication to the "Rural New-Yorker" for July 25, 1896, I proposed that the insect be popularly known as the "Blueberry Span-worm," in recognition of its destructive work on that plant.

The moth was first described in 1862 (Cat. Brit. Mus., XXVI., 1667), from a Canadian specimen in the D'Urban collection. Dr. Packard again described it as *argillacearia* in 1874; this name was found to be synonymous with Walker's earlier name, *inceptaria*, by Mr. Moffat, as recorded by Mr. Hulst (Ent. News, VI., p. 11, 1895). Dr. Packard records the moth from Maine, Massachusetts, Pennsylvania, and Canada (Mon. of Geom., p. 258). He states that "it is very abundant in pine woods in Maine on a dry soil, rising and fluttering with rather a feeble flight, and soon settling again. In July, 1874, I captured thirty males before securing a female; the latter are apparently less ready to fly."

Heretofore nothing seems to have been known of the early stages of this Geometrid. Whether there is more than one brood of the caterpillars is not known. Doubtless the practice of burning over the blueberry fields every few years greatly checks the pest. The larvæ will probably quickly succumb to a Paris green spray, and a little united effort among those interested would soon control this blueberry span-worm.

#### THE BUMBLE FLOWER-BEETLE (*Euphoria inda*, Linn.).

This yellowish-brown beetle, with its wing-covers sprinkled all over with small, irregular black spots (shown at *a* on the plate, twice natural size), is our most common flower-beetle in the North. "It is one of the first insects to appear in the spring. It flies near the surface of the ground,

with a loud, humming sound, like that of a bumble-bee, for which it is often mistaken. During the summer months it is not seen, but a new brood appears about the middle of September. The beetle is a general feeder, occurring upon flowers, eating the pollen; upon cornstalks and green corn in the milk, sucking the juices; and upon peaches, grapes, and apples. Occasionally the ravages are very serious." (Comstock's Manual for the Study of Insects, p. 565.)

Although this beetle is so common, and has been known for more than a hundred years, nothing was recorded of its earlier stages (beyond the fact that it occurred in its various stages in the nests of ants) until December, 1894. Then Mr. Chittenden (Insect Life, VII., 272) recorded the rearing of the beetle from larvæ found in manure on Long Island. When found, July 9th, the larvæ were encased in cocoons, and the last week in August these cocoons contained living adults.

On June 19th and July 8th, 1896, I received a large number of grubs from Mt. Kisco, N. Y. They were found in a manure pile that had not been disturbed since the preceding August, and from the soil beneath another pile made in October and moved in the following April. One of these grubs is represented, twice natural size, at *c* on the plate. When compared with a white grub (*Lachnosterna*, sp.), it was found to be considerably shorter and thicker-set; its legs were not more than one-half as long, and its head was also much smaller than that of the white grub. The dull leaden hue of the body, due to the contents of the food-canal, indicated that its food consisted of dead vegetable matter rather than living roots, as in the case of the white grub. When they were placed on their feet or venter, they would crawl an inch or so and then roll over and crawl with considerable rapidity, with a wave-like motion, on their backs. I also found several similar grubs in a pile of rotting sod and manure which had not been disturbed for a long time. I have seen no evidence of their eating the roots of living plants.

The grubs were placed in cages containing rotting sod and manure, in which they quickly buried themselves. Twenty days later, July 28th, the grubs had changed to pupæ in earthen cocoons of the somewhat peculiar and definite shape shown, twice natural size, at *b* on the plate. Evidently the grub forms an earthen cell in the soil by rolling and twisting about; and then cements together the particles of earth composing the walls of the cell so as to form an earthen cocoon, which retains its form

when removed from the soil. Each cocoon has a curious roughened or more granular spot on one side (the upper side in the figure).

The white pupa is shown, twice natural size, at *d* on the plate. In pupating, the larval skin is shed off the anal end in the same manner as caterpillars do. In the case of the Spotted Pelidnota (*Pelidnota punctata*), however, the larval skin splits down the whole length of the back, retains the larval shape, and forms a covering for the pupa, which remains inside.

On August 13th, or sixteen days after pupæ were found in the cages, several beetles emerged. They continued to appear daily until September 10th; more (33) emerged on August 22nd than on any other day. They proved to be *Euphoria inda*, Linn.

This bumble flower-beetle evidently feeds only on decaying vegetable matter, as rotting sod or manure, and is thus destructive only in the beetle state. The beetles seem to do most of their injury soon after they emerge in the early fall. One correspondent wrote me that he collected forty-five of the beetles in one day on a single ripe peach. Doubtless the beetles hibernate, but whether egg-laying takes place in the fall or spring is not known. The fact that manure piled in August and October contained many nearly full-grown grubs the next June indicates that the eggs are laid and hatched in the fall, otherwise the grubs must develop very rapidly after hatching from eggs laid in the spring. There seems to be one brood of the insect in the course of a year. Hand-picking of the beetles is apparently the most practicable method of combating it when it is found working on ripe fruits or on green corn.

Since the above was written, some further notes on this insect (read by Dr. Lintner at the Buffalo meeting of A. E. C. last August) have been published. Larvæ were sent to Dr. Lintner in chip manure in the latter part of June. On August 8th two beetles had emerged in his cage, and an examination of the earthen cells revealed other beetles and several pupæ. An instance is given which seems to indicate that there is a possibility that the grubs may have attacked growing corn, but the evidence is not conclusive.

BUTTERFLIES OF NORTH AMERICA.—Mr. Edwards is about to publish the last Part, the seventeenth, of the third volume of this magnificent work. It will contain three plates, illustrating *Chionobas Iduna*, California, *Oeno*, Varuna and Alberta, with their early stages, and the imago of *C. Peartia*. There will also be accounts of *Papilio Brucei* and *Ajax*, *Neophasia Menapia*, and *Colias Eriphyle*; and supplementary notes on a large number of other species, with title page and index.

DESCRIPTIONS OF SOME NEW GENERA AND SPECIES OF  
CANADIAN PROCTOTRYPIDÆ.

BY WILLIAM H. ASHMEAD, WASHINGTON, D. C.

The following new genera and species of Proctotrypidæ were all collected in Canada by Mr. W. Hague Harrington, of Ottawa.

## SCORPIOTELEIA, gen. nov.

Abdomen with five visible segments; the last three segments long, slender, cylindrical, together as long as the second, and resembling the terminal segments of a scorpion; the third segment is about as long as the fourth and fifth segments united, the fifth pointed. Front wings with the marginal vein shorter than the marginal cell, and scarcely twice as long as the first abscissa of radius, which is slightly oblique. Antennæ 15-jointed, filiform, the first joint of flagellum the longest, about half the length of the scape, the following joints to the last very gradually shortening, the penultimate joint being about twice as long as thick, the last joint oblong-oval, one-half longer than the preceding.

(1) *Scorpioteleia mirabilis*, sp. n.

♀.—Length, 4 mm. Smooth, shining, pubescent; head and thorax black, collar and prosternum brownish; petiole and the large second abdominal segment brownish-piceous, the three terminal segments yellowish; mandibles, legs and basal four joints of antennæ ferruginous, the flagellum blackish towards apex; palpi yellowish.

The mesonotal furrows are deep, distinct; the scutellum has a large, deep fovea across the base; while the metanotum is smooth, tricarinate, with the posterior angles subdentate. Wings hyaline, pubescent, the tegulæ yellowish, the veins broad. Abdominal petiole longer than the metathorax, a little thicker towards base than at apex, striated, about three times as long as thick, rest of abdomen smooth, polished.

Hab.—Kettle Island, in Ottawa River, August 18, 1894.

## STYLIDOLON, gen. nov.

Abdomen with six visible segments, the body of same being long and very slender, twice as long as the petiole, and gradually acuminate toward apex, which has a gentle upward curve; the second segment is scarcely longer than the petiole, the dorsum of same triangularly emarginated at apex; the third segment dorsally, on account of the emargination in the second, a little longer than the fourth and fifth, but ventrally it is not longer than these two segments united; the fifth is shorter than the fourth; the sixth is conically pointed, a little longer than the third. Front

wings with the marginal vein as long as the marginal cell, or about  $2\frac{1}{2}$  times as long as the oblique first abscissa of radius. Antennæ 15-jointed, filiform, the first joint of flagellum about two-thirds the length of the scape, the following joints to the sixth gradually shortening; joints 7 to 11 much shorter, subequal, about twice as long as thick; the 12th very little longer than thick, the last joint thicker, ovate, nearly as long as the two preceding united.

(2) *Stylidolon politum*, sp. n.

♀.—Length, 3.5 mm. Polished black, shining, pubescent; tegulæ, scape and pedicel ferruginous, the flagellum black or brown-black. Wings hyaline, the veins dark brown. Legs rufous, the articulations paler or yellowish, the hind coxæ black or piceous black.

Hab.—Ottawa, May 13, 1896.

MIOTA, Förster.

(3) *Miota rufopleuralis*, sp. n.

♀.—Length, 2 mm. Polished, shining, pubescent; head black; dorsum of thorax and body of abdomen, except the tip, brown-black or piceous; mandibles, collar, sides of thorax and beneath, rufous; palpi, scape, pedicel, legs and petiole of abdomen, yellowish.

The antennæ are shorter than the body, the flagellum being brown-black; scape as long as flagellar joints 1 to 4 united, the first flagellar joint the longest, not more than thrice as long as thick, the joints beyond very gradually shortening, the three or four penultimate joints only a little longer than thick, the terminal joint conical, only a little longer than the preceding joint. Wings hyaline, the tegulæ yellowish, the veins brownish, the marginal vein very short, only a little longer than the first branch of the radius, or scarcely one-third the length of the radial cell.

Hab.—Hull, P. Q., August 14, 1894.

(4) *Miota Canadensis*, sp. n.

♀.—Length, 2.5 mm. Polished black; first three joints of antennæ, the tegulæ and legs brownish-yellow; palpi white.

The antennæ are not quite as long as the body; scape as long as flagellar joints 1 to 3 united, the first flagellar joint the longest, more than four times as long as thick; flagellar joints 7 to 12 hardly longer than thick. Wings hyaline, the veins brownish-yellow, the marginal vein about three times as long as the first abscissa of radius, or as long as the marginal cell.

Hab.—King's Mountain, Chelsea, P. Q., August 12, 1894.



## ZELOTYPÆ, Förster.

(5) *Zelotypa fuscicornis*, sp. n.

♂.—Length, 2.5 mm. Polished black, pubescent; antennæ longer than the body, fuscous, the scape hardly as long as the pedicel and first joint of flagellum united, the latter excised at basal one-half. The flagellar joints 2 to 11 subequal, about four times as long as thick; legs brownish-yellow, the hind coxæ black. Wings hyaline, the veins brown, the marginal vein hardly two-thirds the length of the marginal cell, or about one and a half times as long as the first abscissa of the radius. Petiole of abdomen rather stout, about two and a half times as long as thick, coarsely fluted.

Hab.—Hull, P. Q., July 23.

## PANTOCLIS, Förster.

(6) *Pantoclis Canadensis*, sp. n.

♀.—Length, 2 mm. Polished black, pubescent, the body of abdomen more or less brownish piceous; antennæ, except the 7 or 8 terminal joints, and legs, brownish-yellow.

The scape is about as long as the first six joints of the flagellum united, the first joint of flagellum being a little longer and more slender than the pedicel, or about twice the length of the second joint; all joints of the flagellum, except the last, are submoniliform and gradually become thicker and broader, the six penultimate joints being a little wider than long, subpedunculate; the last joint is conical, a little longer than the preceding. Wings subhyaline, the veins dark brown, the radial cell rather small, triangular, a little longer than the oblique first abscissa of radius. Petiole of abdomen scarcely twice as long as thick, opaque, coarsely fluted.

Hab.—Ottawa, August 13, 1894.

(7) *Pantoclis similis*, sp. n.

♂.—Length, 2.6 mm. Polished black, pubescent; two basal joints of antennæ, the palpi, the tegulæ and the legs, including all coxæ, brownish-yellow.

The antennæ are shorter than the body, the scape being about as long as the pedicel and first joint of flagellum united; flagellum brown-black, the first joint the longest, not quite five times as long as thick, with the basal one-third strongly excised, the following subequal, but very gradually shortening, so that the three terminal joints are scarcely two and a half times as long as thick. Wings hyaline, the veins brownish,

the marginal vein about two-thirds the length of the marginal cell, or one-half longer than the oblique first abscissa of radius. Petiole of abdomen stout, two and a half times as long as thick, fluted.

Hab.—Russell's Grove, Hull, P. Q., August 5, 1894.

### A NEW WATER-BUG FROM CANADA.

BY WILLIAM H. ASHMEAD, WASHINGTON, D. C.

*metaboly nymph*  
The interesting new species of water-bug described below was received some time ago from Abbé P. A. Bégin, of Sherbrooke, Canada. It was captured swimming on a fresh-water stream some little distance above Sherbrooke, and is of more than ordinary interest, from the fact that it belongs to the genus *Halobatopsis*, Bianchi\*, a genus not yet recognized in the North American fauna, and only recently characterized, being based upon the South American *Halobates platensis*, Berg., also a fresh-water species.

*Halobatopsis Béginii*, n. sp.

♀.—Length, 2.3 to 2.5 mm. Oval, velvety black; a yellow dot or spot on middle of pronotum anteriorly, a larger, somewhat triangular, yellow spot, but more or less variable in shape and size, on the upper basal hind angle of the mesopleura close to the base of the metapleura, while beneath, the mesosternum anteriorly and posteriorly and along the median furrow or suture is more or less broadly margined with yellow. Antennæ scarcely two-thirds the length of body; the first joint subclavate, slightly curved, shorter than the three following joints united, but distinctly longer than joints 2 and 3 combined; joints 2 and 4 subequal, longer than the third, the latter being about three-fourths the length of the second; the fourth or last joint is fusiform. The legs in all my specimens are broken, but are similar to those found in *Trepobates*, Uhler (= *Stephania*, White), the middle legs being much the longest pair. The anterior legs are very short, shorter than the body; the femora, with their trochanters, being about as long as the tibiæ and tarsi combined; the tarsi, consisting of only a single joint, being a little longer than half the length of tibiæ; middle legs very long, their femora alone being as long or even longer than the body, the tibiæ being fully one and a half times as long as the femora, the tarsi about half the length of tibiæ. The hind legs in all my specimens are broken, but the femora, which alone remain, are much slenderer and considerably longer than those of the middle pair.

Hab.—Sherbrooke, P. Q., Canada. Dedicated to Abbé P. A. Bégin, the discoverer of the species and a most valued correspondent.

\*Ann. Musée Zool. l'Acad. Imp. des Sci. de St. Petersburg, 1896, p. 70.



## MAMESTRA CIRCUMCINCTA, SMITH.

BY JOHN B. SMITH, SC. D., NEW BRUNSWICK, N. J.

The above species was described by me in the Proceedings of the U. S. National Museum, Vol. XIV., page 253, in my revision of the genus *Mamestra*. Recently Mr. Grote has questioned the distinctness of this species from *olivacea*. I could hardly credit this as being serious, and barely referred to the matter in the September, 1896, number of the CANADIAN ENTOMOLOGIST, page 240. In the December number, page 301, Mr. Grote returns to this subject, and again suggests that *circumcincta* may be either *olivacea* or *comis*. He refers to the fact that the description resembles that of both the species cited by him, and brings in Mr. Beutenmüller to testify to the fact that my species closely resembles *olivacea*. Mr. Beutenmüller is not a specialist in the Noctuidæ, and not entitled to an opinion that would carry decisive weight. Furthermore, it was not fair to Mr. Beutenmüller to ask him to make the comparison without first referring him to my description. Mr. Grote speaks as if the statement that *circumcincta*, or its description rather — for he has never seen the species — resembles *olivacea* was an important one and a discovery of his own. He does not refer to the fact that in my description I say: "the male resembling *olivacea* so strongly that I compared it closely at first, expecting a variety of this protean form." It seems to me it would be impossible to state more definitely the fact that I recognized the very close resemblance, superficially, between the species newly described by me and the very variable one long ago characterized. Mr. Grote also omits entirely the fact that the last sentence in the description and my comment on it reads: "The sexual characters, however, refer the species to the *renigera* group." On plate X., accompanying my paper, I delineate the sexual structures of *circumcincta* at figure 52, and of *olivacea* at figure 53. The two are so utterly different that it is simply impossible that one type should be a modification of the other. My species is, therefore, based upon a structural character primarily, and after that upon colour and markings. Now, if Mr. Grote will claim that these structural characters are not of specific value, then the question of whether my species may be *olivacea* is open for discussion. Until he takes this stand, these two species cannot be compared for a moment whatever their superficial similarity may be. I have asserted time and again that differences in sexual structure invariably indicate differences in species. Many other Entomologists have taken the same stand. Mr.

Grote has not, so far as I know, taken any stand in the matter, except so far as to deny the value of these characters for generic separation. If he is willing to assert that these structures have no specific value, then the question is an open one; but I submit that to bring the matter before the readers of the CANADIAN ENTOMOLOGIST, as if there was a mere matter of colour and marking to be considered, is neither scientific nor honest. Before suggesting the identity of the two species he should have referred to the fact that I recognized their superficial resemblance, and separated them upon a distinct structural character.

One other point in Mr. Grote's paper is worth noting. In the matter of *Agrotis crassa*, Mr. Grote excuses his failure to recognize the true character of the frontal structure by stating that neither he nor the Museum with which he is connected possesses a microscope. He does not distinctly say so, but it would seem as if neither did they possess an ordinary hand lens of from  $\frac{1}{2}$  to  $\frac{3}{4}$  inch focal length, which is all that is necessary to recognize external structures of Noctuid moths serving for the division of genera. If not even the simplest and most necessary appliances for study are at hand, is any man justified in making assertions on points concerning which he cannot have any possible certainty? But even without the optical assistance to which I have referred, surely either Mr. Grote or the Institution at Hildesheim has in its possession a little camel's-hair brush, and with this, or even the frayed end of an ordinary wooden toothpick, the scales from the front can be sufficiently removed to enable one to recognize the frontal structure with the unassisted eye. One who makes assertions as to structure, should at least take every means within his power to make certain that they are accurate. Mr. Grote evidently has not done this, and in every assertion that he has made, concerning the identity of genera in this *Feltia* matter, I have proved him wrong. To escape from the necessity of considering his genus *Carneades* a synonym of *Agronoma*, he seems now to be willing to recognize the distinctness of the division that I have called *Porosagrotis*, basing it, however, upon the fact that the antennæ in the typical species are pectinated. This he considers a good generic character, differing in that point from all the authors who have written on this genus. Unfortunately, the genus *Carneades* contains species with antennæ pectinated and antennæ serrated, and so also does the genus that I have called *Porosagrotis*. There is no line of distinct demarcation between these two types of antennal structure, so that I could not utilize them even for

divisions within the genus. The ordinary type of antenna in *Carneades* is what Mr. Grote has called brush-like, and consists of joints with more or less marked lateral projections, bearing on all sides stiff, bristly hair. It is the form that is called "bristle-tufted" by other authors. The lateral projections vary in size in the species, and when they become evident to the naked eye the antenna is called pectinated. The pectinations may be long or short, and the distinction between a shortly-pectinated antenna and one that is merely "brush-like" is entirely a matter for the individual judgment of the author who uses the term, as the two forms grade into one another imperceptibly. Mr. Grote cannot escape either admitting that the sexual character that I have made use of to separate *Porosagrotis* is a good one for the generic purposes or admitting that *Agronoma* must supercede *Carneades*. It does not make any difference to me which he chooses, because it does not distress me, as Mr. Grote says it does him, to have any name proposed by me relegated into the synonym, whenever there is scientific cause for it set forth by one whose methods of work and accuracy of research entitle him to the confidence of those for whom he writes.

#### MONODONTOMERUS IN APPALACHIA.

BY W. H. PATTON, HARTFORD, CONN.

##### MONODONTOMERUS STIGMA (Fabr.).

*M. virideneus*, Prov., Canada.

Common in New England. In the District of Columbia I have reared it from the cell of *Melitoma euglossoides*, var. *taurea*, Say.

The genus *Oligosthenus* cannot remain separated, the fine dentitions of hind femora being more or less indistinct.

A frequent variety has no cloud about stigma. The abdomen varies in the amount of purple.

A male taken by me at Hartford, Conn., Aug., 1895, differs decidedly from the male of *M. montivagus*, Ashm., described by Mr. Cockrell in the CAN. ENT., XXVIII, 127, May, 1896. My male measures 3 mm. in length. It has no cloud about stigma; the abdomen is purple, except apex and most of the first segment. The scape is slender, as in the female; the flagellum is as in the female. Hind coxæ and femora much more swollen than in the female, tooth longer, no denticulations. The abdomen is short, broad; dorsum flat, shining. The descriptions of the females do not differ specifically.

## THE COLEOPTERA OF CANADA.

BY H. F. WICKHAM, IOWA CITY, IOWA.

## XXI. THE CHRYSOMELIDÆ OF ONTARIO AND QUEBEC — (Concluded).

## Tribe X.—HISPINI.

The form alone of these little beetles is amply sufficient for their separation from the other tribes of Chrysomelidæ. They are more or less wedge-shaped, the elytra often broadly and squarely truncate behind and with rows of deep punctures, sometimes costate as well. Only two of the North America genera have been recorded from our territory, *Microrhopala*, with 8-jointed antennæ (owing to the fact that the last four joints are closely connate), and *Odontota*, in which the antennæ are 11-jointed. The middle tibiæ are straight in both of these genera.

## MICRORHOPALA, Chev.

## A. Elytra with only eight series of punctures.

- b. Head usually red, thorax red, elytra blue-black with side margin and discal vitta red. .21-.25 in. . . . . *vittata*, Fabr.

- bb. Head, thorax and elytra unicolorous (bluish, greenish or bronzed).

Punctures of the outer rows of elytra larger than inner. .20 in. . . . . *excavata*, Newm.

Punctures of outer rows like those of the inner. .22-.25 in. . . . . *cyanea*, Say.

- AA. Elytra with more than eight series of punctures on a part of their length, the fourth interval bearing four rows near the apex.  
Form more elongate. .12 in. . . . . *porcata*, Mels.

## ODONTOTA, Chev.

- A. Elytral punctures in ten rows; more or less distinctly costate.

Elytra reddish or yellowish, with black sutural stripe.  
.24-.26 in (fig. 10) . . . . . *dorsalis*, Thunb.

Elytra blackish, humeri sometimes reddish.

Body beneath black, thorax in part and humeri of elytra red. .22-.28 in. . . . . *scapularis*, Oliv.

Body beneath and thorax red, elytra black. .24 in. . . . . *bicolor*, Oliv.

Elytra rosy or reddish yellowish, much broader at apex, and with serrate, explanate margin, the disc indistinctly marked with



FIG. 10.

- dark spaces. Under surface variable in colour, thorax coloured like the elytra. .24-.26 in. .... *rubra*, Web.
- AA. Elytral punctures in eight rows, costæ acute. Colour variable, usually with head dark, thorax and elytra pale with dark spots of irregular shape. .15 in. .... *nervosa*, Panz.

## Tribe XI.—CASSIDINI.

These are the "tortoise beetles" or "helmet beetles" found on morning glories and other convolvulaceæ. They are easily recognized on account of the peculiar form, which is circular or elliptical in outline, the upper surface convex, the margins of elytra and thorax explanate (to a varying degree), the head concealed. Some of them, notable *Coptocycla aurichalcea*, which, with its larva, is often abundant on the morning glory, are of most brilliant golden and greenish tints when alive; these, however, being lost at or after death. The three genera found in Canada are as follows:

Size large (.38-.46 in.), form more elliptical.

Head partially exposed, thorax and elytra spotted. . *Chelymorpha*.

Head entirely covered, thorax spotted, elytra plain. . . . *Physonota*.

Size small (.20-.30 in.), head entirely covered, antennæ longer than thorax. .... *Coptocycla*.

## COPTOCYCLA, Chevz.

Three species are recorded, one of which, *C. clavata*, Fabr., is easily known by its size (.30 in.), the brown elytra, which are roughened and gibbous, and the transparent spot on the middle of the outer margin. It occurs on the "ground cherry." The others have the elytra nearly even without gibbosities, and are closely allied. Mr. Crotch separates them by the fact that in *aurichalcea*, Fabr., the body beneath and the last four joints of the antennæ are black, while in *guttata*, Oliv., the sides of the body beneath are reddish and the last two joints of the antennæ are black. Both are of about the same size, a trifle under a quarter of an inch in length.

## PHYSONOTA, Boh.

A rather large insect of a greenish or pale yellow colour, the thorax spotted, the principal and most constant spot being a large one near the middle. Two others are usually present near the base. Elytra not maculate. It is described by Say as *P. unipunctata*.

## CHELYMORPHA, Chevr.



FIG. 11.

Represented by *C. argus*, Licht., of the size of the preceding species (.36-.48 in.), yellowish or reddish above, black beneath. Thorax with four black spots in a curved transverse row, behind which are often two others. Elytra usually with six black spots on each, arranged as shown in Fig. 11, and a common spot just posterior to the scutellum. Legs usually black. The prosternum is rather deeply longitudinally grooved and produced in front.

The following bibliography gives the names of the principal papers on the North American Chrysomelidæ; a few short articles have been omitted to economize space, since the genera have been treated in the more extended papers cited.

- 1845-1848.—Lacordaire, Th. Monographie des Coléoptères subpentamères de la famille des Phytophages. 2 Vols. Mem. Soc. Roy. Liege, Vols. III. and V.
- 1849.—Haldeman, S. S. Cryptocephalinorum Borealis Americæ diagnoses. Jour. Acad. Nat. Sci., N. S., I.; Proc. Acad. Nat. Sci., IV.
- 1852-1854.—Suffrian, E. Monographie und kritisches Verzeichniss der Nordamerikanischen Cryptocephaliden. Linnæa Entom., VI. and VII.
- 1856.—Rogers, W. F. Synopsis of the species of Chrysomela and allied genera inhabiting the United States. Proc. Acad. Nat. Sci., VIII.
- 1862-1865.—Stal, C. Monographie des Chrysomelides de l'Amérique. Upsal.
- 1865.—Leconte, J. L. On the species of Galeruca and allied genera inhabiting North America. Proc. Acad. Nat. Sci., Philadelphia.
- 1866.—Leconte, J. L. Practical Entom., II., p. 9 [Prasocuris].
- 1873.—Crotch, G. R. Material for the study of the Phytophaga of the United States. Proc. Acad. Nat. Sci., Philadelphia.
- 1880.—Leconte, J. L. Short studies of North American Coleoptera. Tr. Am. Ent. Soc., VIII. [Cryptocephalini].
- 1883.—Horn, Geo. H. Chrysomelidæ, Hispini. Miscellaneous notes and short studies of N. A. Coleoptera. Trans. Am. Ent. Soc., X.
- 1889.—Horn, Geo. H. A synopsis of the Halticini of Boreal America. Tr. Am. Ent. Soc., XVI.
- 1891.—Leng, Chas. W. Revision of the Donaciæ of Boreal America. Tr. Am. Ent. Soc., XVIII.



- 1892.—Horn, Geo. H. Studies in Chrysomelidæ. Tr. Am. Ent. Soc., XIX.  
1892.—Horn, Geo. H. The Eumolpini of Boreal America. Tr. Am. Ent. Soc., XIX.  
1893.—Horn, Geo. H. The Galerucini of Boreal America. Tr. Am. Ent. Soc., XX.  
1896.—Linell, M. L. A short review of the Chrysomelas of North America. Jour. N. Y. Ent. Soc., IV.

Since the note on the genus *Zeugophora* was printed (on p. 73 of the previous volume) two other species have been received from Mr. R. J. Crew, of Toronto: *Z. Kirbyi*, Baly (*Reineckei*, Grote), which is uniformly yellowish above, and *Z. scutellaris*, Suffr., in which the head and thorax are entirely yellow, while the elytra are black, with large punctures, separated by more than their own diameters. Collectors should be on the lookout for *Z. consanguinea*, Cr., which differs from *scutellaris* in having the occiput black, while the elytral punctures are close. It is known to me from Wisconsin, Illinois, and Manitoba.

Attention should be called to a clerical error in the table of *Chrysomela*. The name *labyrinthica* should read *pnirsa*. Dr. Leconte is said to have distributed it under the manuscript name of *labyrinthica*, and in thinking of it by this characteristic cognomen the error was committed.

#### ON THE MEXICAN BEES OF THE GENUS AUGOCHLORA.

BY CHARLES ROBERTSON, CARLINVILLE, ILLINOIS.

In the Transactions of the American Entomological Society, XX., 147, after notes and descriptions of five species of *Augochlora*, I gave the following note: "All of the species of *Augochlora* mentioned above agree in having the hind spur serrate with numerous fine teeth, and form a distinct section of the genus. Another section, to which belong *A. lucidula*, Sm., *A. sumptuosa*, Sm., and *A. humeralis*, Ptn., is characterized by having this spur provided with four or five long teeth."

In the January number of this journal, XXIX., 4-6, Prof. Cockerell makes use of these distinctions—under more obscure terms, however—and has given special names to these sections, and that, too, without referring to my note. I have no objections to his giving names to the sections, however, for I have had ample opportunity to do so, if I had

desired. My note was intended for the use of students of these insects, and was given to call attention to the form of the hind spur, the importance of which was not indicated in the descriptions because all of these had the spur of the same form.

It is nothing new to me to hear that the males of *A. viridula* and *A. fervida* have the hind spurs different from the females. Indeed, I have never supposed that the spurs of the males of *Halictus* and *Augochlora* presented any important characters, though, as a rule, I have mentioned the form of the hind spurs in the descriptions of the females.

In Trans. Am. Ent. Soc., XXII., 118, I indicated *A. lucidula*, Sm., as a synonym of *A. viridula*, Sm. I intended to confirm Patton's view that the former was the female of the latter, and cited the place where he had expressed it. As regards the synonymy of *A. fervida*, Sm., and *A. humeralis*, Ptn., the description of the male of Patton's species is the only thing which leaves any doubt in my mind. I think they are the same, however. Two of my specimens have the tarsi pale testaceous, while a third has all except the basal joint dark, seeming to connect the typical *A. fervida* ♂ with the male described by Patton. I have no doubt at all about what I have identified as *A. humeralis* being the female of *A. fervida*, and that is all I have said about it.

The females of the first division do not have the spurs "ciliate or simple," but serrate with numerous fine teeth. The spurs are to be distinguished mainly by the number and length of the teeth, a fact which is obscured by the terms "ciliate" and "pectinate." The females of the second group have the spurs with only four or five long teeth.

It is one thing to use these characters in separating the species, and quite another to found named sections upon them before it is shown that they are valid indications of relationship throughout the genus. If we assume that *Augochlora* is a genus distinct from *Halictus*, or even a natural section of that genus, we must admit that the form of the hind spur is a case of parallel modification, and no proof of affinity. Otherwise, we must subdivide each genus and rearrange the species according to the form of the spur. In *Halictus*, I am satisfied that some species with few-toothed spurs are more closely related to species with finely serrate ones than to some species whose spurs are more like their own. Judging from analogy, we may expect to find the same thing in *Augochlora*.

## NEW FORMS OF OSMIA FROM NEW MEXICO.

BY T. D. A. COCKERELL, MESILLA, N. M.

*Osmia prunorum*, n. sp.

♀.—Length, 9 mm.; shining dark greenish-blue, densely punctured with pale ochreous pubescence. Head subquadrate, face and front so densely punctured as to be cancellate; pubescence thin except on occiput; clypeus punctured just like the front, with no central keel, the anterior margin broadly dark purple, the edge straight and entire, two converging brushes of orange hair projecting from beneath it. Mandibles with the two lower teeth long and pointed. Antennæ rather short, flagellum only feebly brownish beneath. Thorax very closely punctured, not very densely hairy; basal triangle of metathorax minutely granular, its extreme base minutely longitudinally plicate. Tegulae black, shining, sparsely punctured. Wings hyaline, faintly dusky beyond the nervures, nervures black. Legs black, with pale brownish or grayish pubescence, rufescent on inner sides of basal joints of tarsi; hind femora quite broad at ends, basal joint of hind tarsi quite stout. Abdomen short, suboval, convex, shining, strongly but not very closely punctured, first joint covered with sparse long pale ochreous pubescence; remaining joints with a sericeous pile, only noticeable in certain lights, when it will take more or less the appearance of bands. Apex with snow-white hairs. Ventral scopa black in middle and yellowish-white at sides.

♂.—A little larger; face and clypeus densely covered with silky white pubescence; pubescence of thorax a deeper ochreous, especially on scutellum. Antennæ long, flagellum rufous beneath. Colour of head and thorax a decided olive green. Wings not dusky beyond the nervures. Pubescence of last four legs sparse and black. Middle tarsi ordinary. Pile of second and third abdominal segments pale ochreous, that of the following segments black except narrowly along hind margin of fourth. Sixth segment with a shallow median depression; its hind margin with a very distinct rounded emargination. Apex with two long black spines.

*Hab.*—Mesilla Valley, N. M.; 3 ♀, 1 ♂ at flowers of plum, College Farm, April 9 (Ckll.); 4 ♀, 1 ♂ at flowers of *Sisymbrium*, College Farm, April 12th (Ckll.). Resembles *O. distincta*, but easily known by the bicoloured ventral scopa. The ♂ seems to resemble that of *proxima*, which I have not seen. This species is apparently referable to the subgenus *Chalcosmia*, Schmeid.

*Osmia phenax*, n. sp.

♀.—Length, 9 mm. This so closely resembles *prunorum* that I had confounded it with it. It differs in the following particulars: Head and thorax olive green, clypeus strongly purple on the disc. Flagellum ferruginous beneath. Pubescence somewhat thinner, and entirely rather dull white. Tegulæ shining rufotestaceous. Wings faintly dusky all over. Abdomen duller, olive green with faint purple tints, punctures larger and closer. Ventral scopa thin and short, pale fulvo-ochreous, uniform in colour. Small joints of tarsi more or less rufescent.

*Hab.*—Mesilla, N. M., at flowers of honeysuckle, April 13, 1895 (Miss J. E. Casad). Also one taken some time ago at Las Cruces, by Prof. Townsend. Easily known by the colour of the tegulæ, which is very unusual for *Osmia*. A specimen was compared by Mr. Fox with the Cresson collection, and returned with the note: "Near *distincta*, colour paler, and wings clear throughout, tegulæ testaceous, punctures of dorsulum stronger."

*Osmia cerasi*, n. sp. or var.

♀.—Length,  $9\frac{1}{2}$  mm.; stoutly built, very dark blue, greenish on vertex and dorsum of thorax, purplish on clypeus. Pleura sometimes black. This agrees with Cresson's description of *O. densa* in almost every particular, and may be only a southern variety of it; but it has the pubescence of the occiput and thorax above bright rust-red, as Cresson describes for *rustica*. The thorax is distinctly green anteriorly. The apical margins of the abdominal segments are dark blue, concolorous with the rest. Pubescence of pleura and face entirely black; ventral scopa black. Tegulæ black. Pubescence of abdomen short, black, except that on first segment, which is longer and pale fulvous. The punctures of the head and thorax are large, and about as close as it is possible for them to be; those of the abdomen are also close. Legs with black hairs.

*Hab.*—Mesilla, N. M., on flowers of cherry, April 14th, 1895 (Miss J. E. Casad); College Farm, Mesilla Valley, April 9th, 1895, on flowers of plum (Miss J. E. Casad). Also one taken at Las Cruces by Miss Agnes Williams (now Mrs. Herbert). The above three are all the species of *Osmia* observed in the Mesilla Valley.

## NOTES ON EUPOEYA AND THE MEGALOPYGIDÆ.

BY HARRISON G. DYAR, NEW YORK.

I have had occasion to refer three times in these pages to the genus *Eupoeya*, placing it, with some doubt, in the *Megalopygidæ*. Very recently I have been so fortunate as to discover the larva in Florida on the mangrove. It is a true Eucleid, contrary to my expectation, but in confirmation of Dr. Packard's original statements. This genus, then, removed from the *Megalopygidæ*, renders it possible to define the family by the branching of vein 1 of primaries, instead of by the pectinations of the antennæ to the tip, which proves to be a fallacious character.

*Megalopygidæ.*

If the family be defined on this character, it appears unfortunate that *Aurivillius* does not refer to it, nor show that part of the wing in the figures in his recent paper on the group. *Aurivillius* would place the African genera *Somabrachys* and *Psycharium* in the *Megalopygidæ*, which is interesting, if well founded, as extending the geographical distribution of the family to the Old World. (*Iris*, Dresden, VII., 189, 1894.)

In CAN. ENT., XXVII., 244 (1895), I referred eight genera to this family. *Eupoeya* may now be omitted, but *Alimera bicolor*, Möschl., may probably be added. Recently Grote doubted (CAN. ENT., XXVII., 136) the correctness of Berg's union of *Lagoa* with *Megalopyge*. Möschler had previously expressed the same opinion (Abh. Senek. Naturf. Gesell., XVI., 122) and stated that *nuda*, the type of *Megalopyge*, differs in antennal characters. "Die Fühler von *nuda* sind kurz, kaum halb so lang wie die Vorderflügel, beim ♂ an der Spitze äusserst kurz gekämmt, während dieselben bei *crispata* länger als der halbe Vorderflügel, stärker und bis am Ende gekämmt sind."

If we accept these characters as diagnostic of the two genera, our species separate as follows:

Genus MEGALOPYGE: contains *nuda* (type), *lanata* and *opercularis*.

Genus LAGOA: contains *crispata* (type) and *pyxidifera*.

The larval characters confirm us in dividing our species into two genera, since the larva of *opercularis* has the hair crested and curled and is furnished with a terminal tail-like tuft, while those of *crispata* and *pyxidifera* are evenly and smoothly haired.

Grote states that *Lagoa* is preoccupied, but I do not find this to be the case in Scudder's Nomenclator. *Pimela*, Clem. is preoccupied by *Pimelia*, Fab. (Coleop.)

The genera of the Megalopygidae at present are as follows :

Aidos Hübn., Carama Walk., Mesocia Hübn., Podalia Walk., Ochrosoma H.-S., Sciathos Walk., Alimera Möschl., Megalopyge Hübn., Lagoa Harr., Sombrachys Kirb. (?) and Psycharium H.-S. (?)

*The larva of Eupoeya.*

The larva of *E. Slossonia* is flattened, green, with four dorsal red dots and fringed with a row of regular hairy appendages. They represent the subdorsal row, are detachable and furnished with heart-shaped basal pieces. There are no stinging spines. The form represents the same special adaptation as in *Sisyrosea*, but superimposed upon the phylogenetic characters of *Phobetron*. Our larva is a green *Phobetron* with all the appendages of the same length and the lateral tubercles atrophied.

Dr. Packard states that *Eupoeya* is not the Cuban *Phryne immaculata*, Grote, but he has neglected to compare the forms listed as *Euproctis argentiflua*, Hübn., *E. fumosa*, Grt., and *E. pygmaea*, Grt., all from Cuba and one of which at least is a Eucleid as shown by Dewitz. (N. act. k. Leop.-Car. Deut. akad. nat., XLIV., 252).

It is curious that the Florida and Cuba forms of *Eupoeya* should be different species, while the recent description of a third form from Jamaica, by Schaus (Journ. N. Y. Ent. Soc. IV., 57), emphasizes this fact and renders it probable that still others will be found on other islands, possibly all mangrove feeders in the larval state.

## FURTHER NOTES ON AUGOCHLORA.

BY T. D. A. COCKERELL, N. M. AGR. EXP. STA.

A portion of my table of Mexican species, on p. 4, should be amended to read as follows:—

5. Hind margins of abdominal segments broadly black, blue-green or more or less purplish-tinted species.
  - (i.) Legs black; only the coxæ, and front femora behind, metallic ..... *Townsendi*, n. sp.
  - (ii.) Legs metallic, blue or green; nervures fuscous.
    - a. Smaller, largely purplish, species ..... *labrosa*, Say.
    - b. Larger, green species, 5th abdominal segment basally purple ..... *Binghami*, Ckll.



Hind margins of abdominal segments narrowly or not black, yellowish-green species.....6.

*Augochlora Robertsoni*, n. sp.

This species had apparently been confounded with *pura*, but Mr. Robertson, who takes it commonly in Illinois, has pointed out good distinctive characters in Tr. Am. Ent. Soc., XX. (1893), p. 146, under the name of *labrosa*, Say. I possess a ♀ specimen from S. Illinois, sent by Mr. Robertson, and accepting his identification of it, had placed *labrosa* in my table of Mexican *Augochlora*, from the characters it presented. Say described his *labrosa* from Mexico, however, and suspecting later an error in identification, I compared Say's description. The result is, that I am convinced that Say did not have Mr. Robertson's Illinois insect before him, and that the latter stands in need of a name, being apparently different from other described North American species. It is accordingly named after the writer who first pointed out its characters, which are, principally, the evenly punctured, not roughened, mesothorax, the broad face and deep emargination of the eyes, in the female; and the fourth ventral segment not broadly emarginate in the male. The stigma and nervures are brown, not very dark, the second submarginal cell is conspicuously longer (squarer) than in *pura*; the legs are very dark brown, the front femora metallic behind. In most respects, the insect is like *pura*, and could easily be confused with it.

Say's type of *labrosa* is said to be a ♀, while the allied *Binghami* is described from a ♂, but I do not think they can be the sexes of one species.

*Augochlora Townsendi*, n. sp.—♂. Length, 10 mm.; head and thorax densely and confluent punctured, brilliant blue-green, pleura becoming very strongly tinted with blue; but the face, especially the clypeus and supraclypeal area, yellowish-green, the latter with a coppery tint. Abdomen dark blue-green, not so blue as the thorax; hind margin of first segment narrowly, and of the others broadly, black; venter black, none of the segments emarginate, nor any trace of the fish-tail brush of *Binghami*. Face broad, emargination of eyes deep; clypeus shining, subcancellate with large punctures, its anterior edge very narrowly at sides, and the labrum, black; labrum striate, mandibles dark, only very faintly rufescent about the middle; antennæ reaching to scutellum, black, feebly rufescent beneath, not at all hooked at tip, first two joints of flagellum

broadier than long, the first a little the shorter; third about as broad as long. Prothorax with a very strong keel running to tubercles; mesothorax evenly and very closely punctured; scutellum very finely and closely punctured at the sides, the disc with a pair of small smooth sublateral areas, a yellowish green than the surrounding parts; post-scutellum very minutely punctured in the middle, coarsely subreticulate at sides; metathoracic enclosure distinct, shining, very blue, with numerous longitudinal ridges; sides of metathorax and the ill-defined truncation very closely punctured. Pubescence of head and thorax scant and pale, rather conspicuous on upper part of face, the hairs beautifully plumose. Tegulae piceous, the outer edge hyaline, the base greenish and with minute punctures. Wings dusky hyaline, stigma dark brown, nervures piceous, second submarginal cell much higher than long. Legs black, with thin white pubescence, coxae in front, and anterior femora behind, metallic blue-green; anterior tibiae in front, and anterior tarsi, rufescent, remaining tarsi more or less rufescent within; hind spur of hind tibia minutely ciliate. Abdomen with first segment having rather large, tolerably close punctures, and a small purple spot on each side; second segment with the punctures conspicuously smaller and closer; third with them still smaller, and much feebler; remaining segments with them minute and feeble. No hair-bands, but short pubescence, shining brilliant silvery in certain lights.

*Hab.*—San Rafael, Vera Cruze State, last of June; collected by Prof. C. H. T. Townsend on plant No. 31, which Dr. Rose says is a *Cordia*, probably *C. ferruginea*. The coloration of this beautiful insect is singularly like that of some new species of *Volucella* taken by Prof. Townsend at the same locality, especially in the effect of the pubescence and metallic colours on the abdomen. It resembles somewhat *A. urania*, Sm., and *A. feronia*, Sm., from Brazil. On the same flowers, at the same time and place as *A. Townsendi*, Prof. Townsend took both sexes of a lovely *Temnosoma*, either *T. smaragdinum* or possibly a new species, since it seems to differ from Smith's description, being larger, the head hardly quadrangular, the wings darker, etc., but it differs so little that it will be advisable to call it *smaragdinum*, Sm., var., until comparison of specimens can be made.

Plant No. 4 (see p. 6) on which *A. Binghami* was taken, has been identified by Miss Vail as *Calopogonium caeruleum* (Benth.) Britt.

## A NEW PYRALID.

BY MARY E. MURTFELDT, KIRKWOOD, MO.

*Titanio helianthiales*, n. sp.

Alar expanse 15 to 16 mm.

Head small, with long, rather bristly scales, of which it is easily denuded, the colours mingled dingy white and buff; labial palpi projecting, elongate triangular, densely scaled, of a buff colour, indistinctly margined with white; maxillary palpi not in evidence; tongue slender, naked, eyes globular, large, purplish brown; antennæ silvery white above, pale brown beneath, the joints distinct and clothed with very short pubescence. Thorax buff with white median line, patagia buff, bordered more or less distinctly with white. Abdomen clothed with buff or fulvous scales, with indistinct bands of white at base. Legs shading from pale brown femora to yellowish-white tarsi. Wings broad. Fore wings, ground colour of black, buff and white scales intermingled, ranging from dark to light in proportion to the number of white scales, which is variable; a narrow, rather indefinite, white streak extends longitudinally from the base of the wing near the inner margin to about the middle; a more distinct white area has its base on the costa in the apical third extending obliquely backward about half across the wing; a narrow white line curves around the outer margin, diverging quite widely from the latter near the apical and the outer angles, most distinct near the costa, where it very nearly touches the base of the costal fascia, to this succeeds a dark band and a second narrower white line followed by a fine black marginal line; fringes white, variegated with two dusky bands. Hind wings yellowish-white at base, shading to dusky toward the outer margin, near which is an obscure whitish band; fringes similarly marked to those on fore wings. Under side of fore wings rather dark, silvery gray, except along the inner margin, where it is almost white; near the apical angle is a light spot, larger and of oblong form in the ♂, small and round in the ♀. Described from two ♂s and two ♀s. The combination of colours gives to the eye the general impression of pale purplish-gray, or "lavender"—to employ a milliner's term—and there is considerable variation in pattern and proportion of the silvery white scales, which makes an exact description difficult.

The adolescent stages of this insect are peculiarly interesting. It is a true leaf-miner and, so far as I have been able to learn, the only member of its family as yet discovered to have that habit. It works between

the cuticles of the leaves of the Russian sunflower and probably of other species of *Helianthus*.

The mine is large, translucent, of irregular shape, but covering an area of from two to two and one half square inches. The black, granular frass drops to the lower margin. The mine and included larva bear considerable resemblance, on a magnified scale, to those of some *Lithocolletis*. Full-grown larva, 15 to 16 mm. long, 3.5 to 4 mm. in diameter across middle segments, from which it tapers gradually toward either end. Form cylindrical, with rounded segments and deep incisions, giving it a sub-moniliform appearance. General colour whitish green, often with a rosy suffusion. Head small, broadly triangular, polished, faintly mottled, dark brown on the lobes, with dingy white, triangular face. The corneous, whitish-green collar has two large, glossy, brown spots covering the greater part of its surface; or, it might perhaps be better described as brown, with broad, pale anterior and lateral margins and medio-dorsal line. Each of the other segments has the usual arrangement of conspicuous, round, dark brown, piliferous spots, from which proceed very fine, short hairs.

The pupation is irregular. In some cases the mature larvæ desert their mines and inclose themselves in oval cocoonets on the surface of the ground, but as a rule they spin up within the mine, in a nidus of loosely-webbed frass, with an inner, more firmly woven cocoon immediately inclosing the pupæ. The latter are short, and thick, of a golden-yellow colour, without marked characteristics.

The imago appears in eight or ten days after the larva spins up.

The mines were discovered August 2nd, 1896, and in all probability were those of a second brood. Another series of mines was found on the sunflower leaves September 5th to 10th, the moths from which issued shortly and probably hibernated—no later mines appearing. I am indebted to my friend, Prof. Fernald, for the generic determination of this interesting species.

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Mailed March 4th, 1897.

